



City of Lynchburg

Stormwater Management

Stormwater Advisory Committee

July 15, 2010

Meeting #3



CDM

Tonight's Agenda



- **Summary of Last Meeting**
- **Introduction to Level of Service and Program Evaluation**
- **Alternative Levels of Service and Benefits**
- **Discussion Session**

NPDES Phase II Program's "Six Minimum Measures"



1. Public Education and Outreach
2. Public Involvement and Participation
3. Illegal Discharge Detection and Elimination
4. Construction Site Runoff Controls
5. Post-Construction Site Runoff Controls
6. Pollution Prevention for Municipal Operations

*The Phase II Rules apply to 100 stormwater
system operators in Virginia*

Four Functional Service Areas of Stormwater Management



PROGRAM MANAGEMENT	REGULATORY COMPLIANCE
<ul style="list-style-type: none">◆ Master planning◆ Complaint response◆ Development review	<ul style="list-style-type: none">◆ Construction and post-construction controls◆ Public education◆ BMP Inspection/Maintenance
OPERATIONS AND MAINTENANCE	CAPITAL IMPROVEMENT PROJECTS (CIP)
<ul style="list-style-type: none">◆ Storm sewer cleaning◆ Culvert cleaning and repair	<ul style="list-style-type: none">◆ Storm System Upgrades & Replacement◆ Stream restoration

Summary of Estimated Annual Program Cost for Stormwater Management (based on FY11)



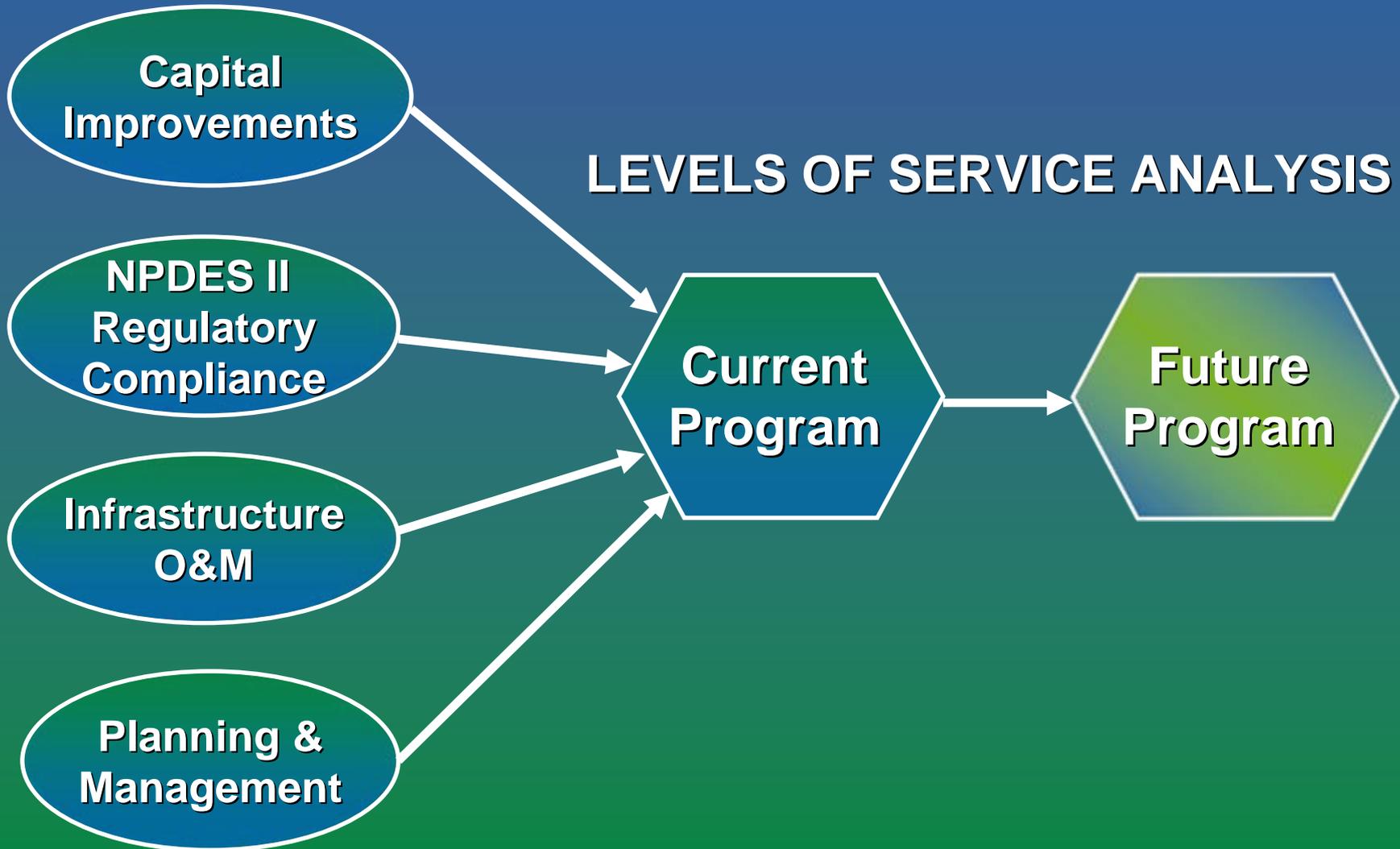
Primary Stormwater Program Costs	Program Management	Regulatory Services	Operation & Maintenance	Capital Improvements	Totals
Utilities					
<i>Non-Departmental</i>	\$19,000				\$19,000
<i>Stormwater System Maintenance</i>	\$162,000		\$234,000		\$396,000
Public Works					
<i>Streets</i>		\$30,000	\$483,000		\$513,000
<i>Engineering</i>	\$139,000	\$4,000			\$143,000
<i>Parks / Grounds</i>		\$4,000	\$71,000		\$75,000
<i>Refuse</i>		\$5,000	\$171,000		\$176,000
Community Development					
<i>Zoning and Natural Resources</i>		\$166,000			\$166,000
<i>Inspections/Code Enforcement</i>		\$26,000			\$26,000
<i>Planning</i>		\$177,000			\$177,000
<i>GIS</i>	\$22,000				\$22,000
Parks & Recreation		\$45,000			\$45,000
Soil and Water Conservation District		\$10,000			\$10,000
Capital Improvements				\$554,000	\$554,000
SUBTOTALS	\$342,000	\$467,000	\$959,000	\$554,000	\$2,322,000
Other Storm-Related Program Costs					
<i>Loose Leaf Collection</i>			\$319,000		\$319,000
<i>Transportation Capital Projects</i>				\$1,340,000	\$1,340,000
<i>Vehicle Depreciation</i>			\$187,000		\$187,000
SUBTOTALS	\$0	\$0	\$506,000	\$1,340,000	\$1,846,000
TOTALS	\$342,000	\$467,000	\$1,465,000	\$1,894,000	\$4,168,000

Future Levels of Service

Driven by Gap Analysis



LEVELS OF SERVICE ANALYSIS



SWAC Process and Schedule



Stormwater Management Overview: May 20 – 6:00 p.m.

Program Components & Expenditures: June 24 - 6:00 p.m.

Level of Service Analysis & Alternatives: July 15 – 6:00 p.m.

Stormwater Funding Options: September 16 - 6:00 p.m.

Revenue Scenarios: October 21 - 6:00 p.m.

Review Recommendations: November 18 - 6:00 p.m.

Evaluate/Modify Recommendations for Council: December 16 - 6:00 p.m.

Finalize Recommendations for Council: January 20, 2011 - 6:00 p.m.

Tonight's Agenda:



- Summary of Last Meeting
- **Introduction to Level of Service and Program Evaluation**
- Alternative Levels of Service and Benefits
- Discussion Session

How is Level of Service Defined for Other Infrastructure?



Transportation



Water

Solid Waste



Public Schools



Wastewater

How is Level of Service (LOS) Defined?



- **Technically Feasible and Reliable**
- **Maintainable**
- **Socially and Politically Acceptable**
- **Environmentally Acceptable**
- **Economically Viable**
- **Financially Affordable**

How is Level of Service (LOS) Defined for Stormwater?



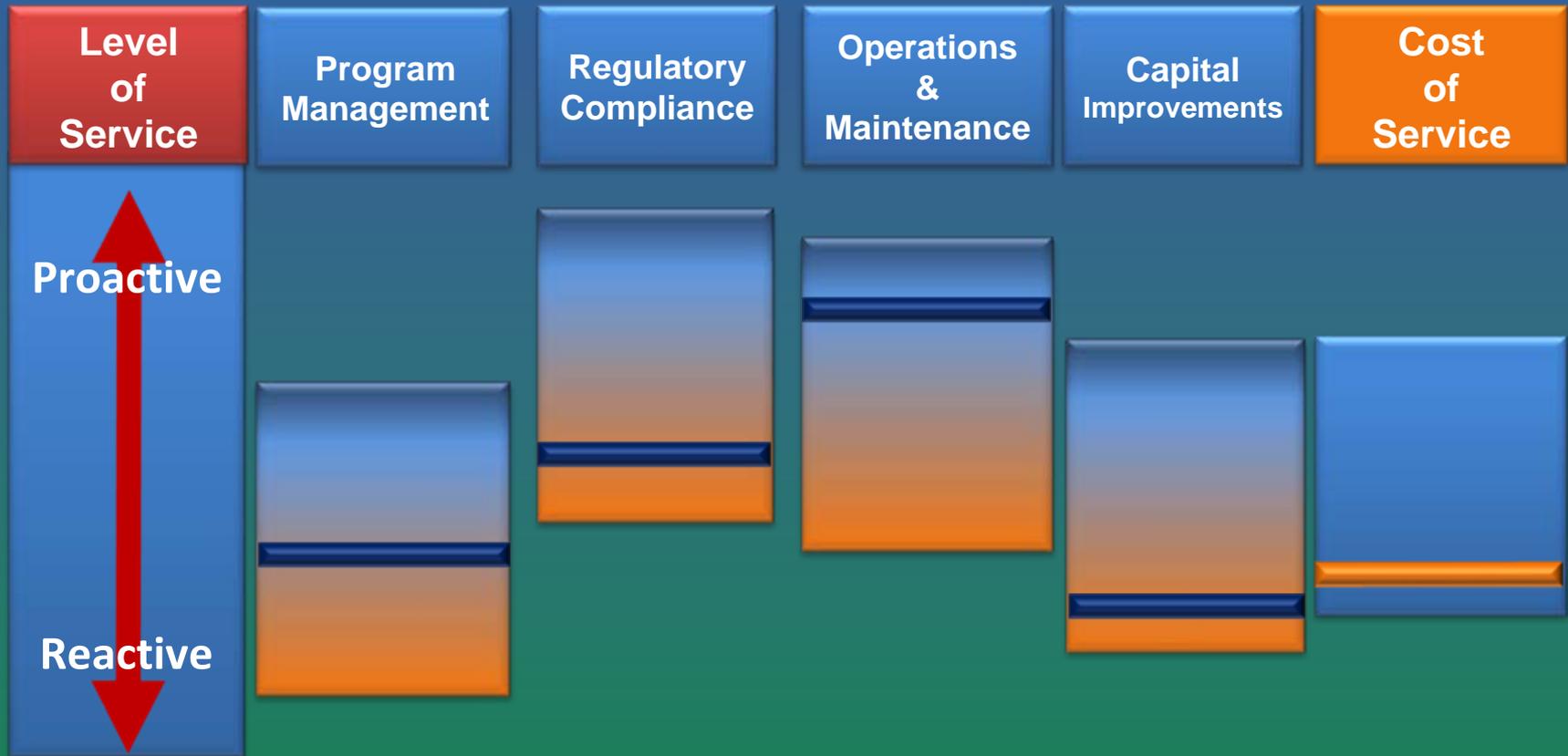
- Erosion
- Water Quality
- Flood protection
- Safety
- Aesthetics

Important Questions Regarding Stormwater Level of Service

1. Citizens' choice, but how much \$\$?
2. Regulations define the minimum, but should we do more?

- VPDES Rules
- VA Impaired Waters
- TMDLs
- FEMA Floodplain

Level of Service Represents the City's Ability to Meet Needs Pro-actively and Effectively



Level of Service Matrix is Used to Evaluate City Services and to Perform Gap Analysis



<i>Level of Service</i>	<i>Program Management</i>	<i>Regulatory Compliance</i>	<i>Operation and Maintenance</i>	<i>Capital Improvement Projects</i>
5	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded
4	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets
3	Priority Planning & Partial CIP Implementation Capabilities	Minimal Permit Compliance	Mixture of Inspection and Responsive Based	Complaint, Inspection-Based / Moderate Budget
2	Reactionary Planning & Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only	Critical Needs Only / Minimum Budget
1	No Planning & No CIP Implementation Capabilities	Non-Compliance	Non-Responsive	No Planning / No Budget

Level of Service Evaluation: Program Management



Program Assets	Program Deficiencies
<ul style="list-style-type: none">• Responsive to citizen complaints/issues• Staff well trained and well versed in rules/regulations• Knowledgeable in-house staff for plan review and inspections	<ul style="list-style-type: none">• Lack of system-wide planning to identify current / future issues or needs• Limited information on the condition and extent of the storm drainage infrastructure system• Decentralized organizational structure

Level of Service = 2

Level of Service Evaluation: Regulatory Compliance



Program Assets	Program Deficiencies
<ul style="list-style-type: none">• Designated engineer for NPDES compliance• All required ordinances in place• No violations for NPDES compliance activities	<ul style="list-style-type: none">• Current resources operating at capacity with limited ability to address pending regulations• Multiple impaired waters throughout City

Level of Service = 3

Level of Service Evaluation: Operation and Maintenance



Program Assets	Program Deficiencies
<ul style="list-style-type: none">• Routine inspection and maintenance of known problem areas• Routine street sweeping program• Routine maintenance of City-owned BMPs	<ul style="list-style-type: none">• Regular maintenance performed on small % of stormwater system• Limited information on the condition and location of aging infrastructure• Lack of dedicated resources to perform routine maintenance activities

Level of Service = 3

Level of Service Evaluation: Capital Improvements



Program Assets	Program Deficiencies
<ul style="list-style-type: none">• Annual allocation of General Fund dollars for small and emergency projects• Effectively leverage other City programs to construct new infrastructure	<ul style="list-style-type: none">• Minimal capacity to address backlog of existing projects• Overall system needs (present & future) are unknown

Level of Service = 2

Level of Service Evaluation: Summary



<i>Level of Service</i>	<i>Program Management</i>	<i>Regulatory Compliance</i>	<i>Operation and Maintenance</i>	<i>Capital Improvement Projects</i>
5	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded
4	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets
3	Priority Planning & Partial CIP Implementation Capabilities	Minimal Permit Compliance	Mixture of Inspection and Responsive Based	Complaint, Inspection-Based / Moderate Budget
2	Reactionary Planning & Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only	Critical Needs Only / Minimum Budget
1	No Planning & No CIP Implementation Capabilities	Non-Compliance	Non-Responsive	No Planning / No Budget

Note: denotes CDM level of service determination for given program area

Estimated Average Annual Stormwater Program Cost = \$2,322,000

Tonight's Agenda:



- Summary of Last Meeting
- Introduction to Level of Service and Program Evaluation
- **Alternative Levels of Service and Benefits**
- Discussion Session

How Can the City Improve Its Level of Service for Stormwater Management?



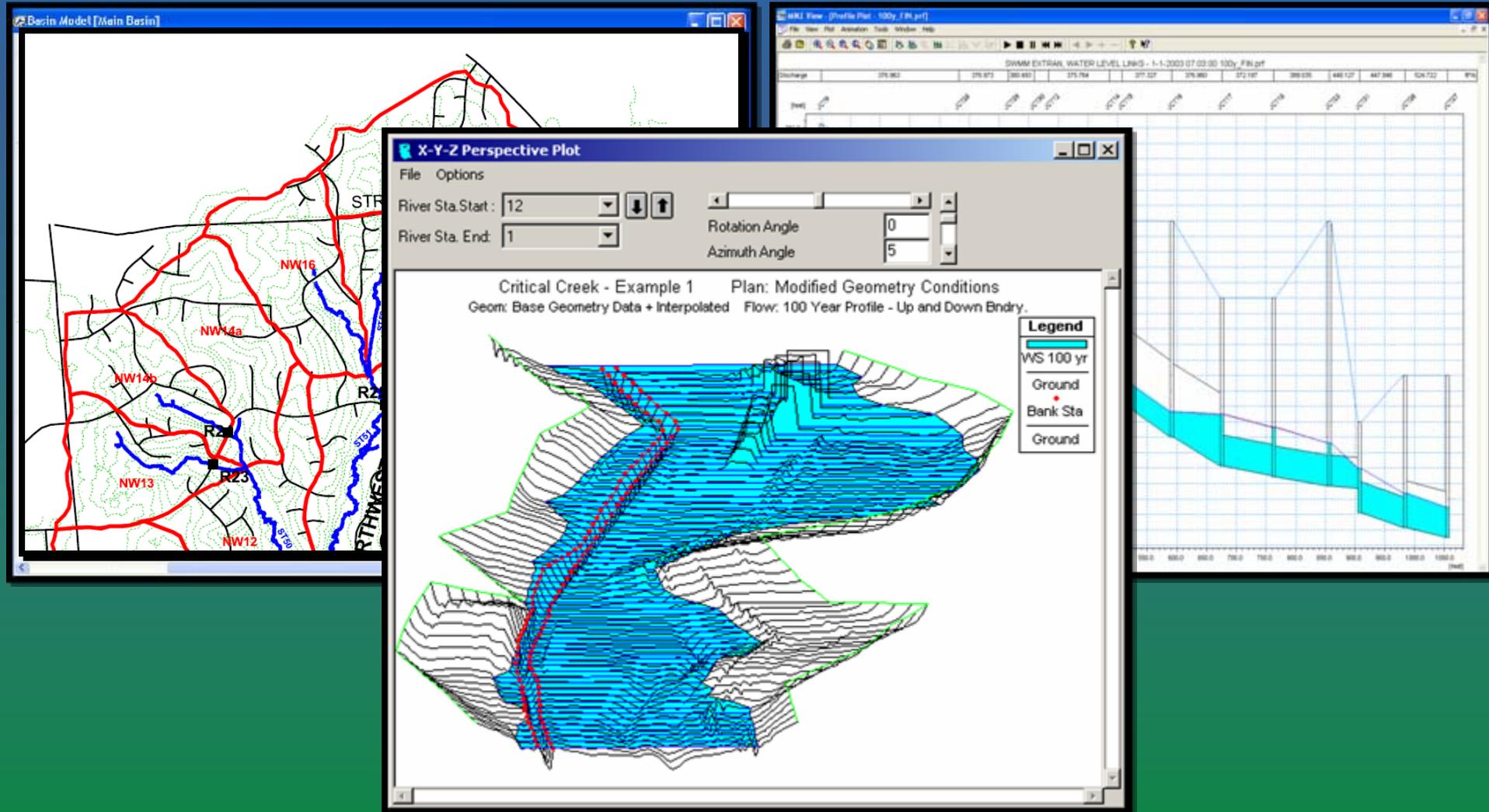
- **Increase knowledge of system** with inventory, condition assessment, and master planning
- **Pro-actively implement programs** to address pending stormwater regulations
- **Routine and preventative maintenance** of the stormwater collection and conveyance system
- **Identify and prioritize capital improvements** based on projected needs and goals for stormwater level of service

Program Management LOS Options

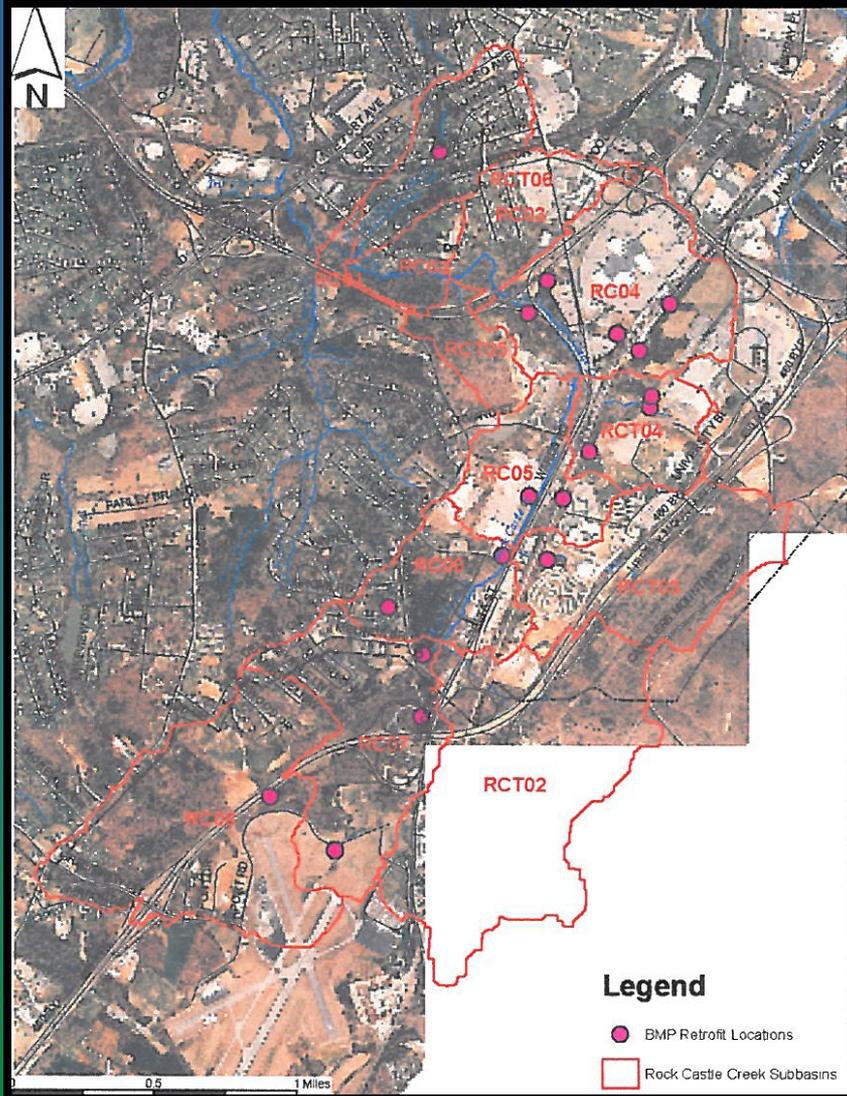


<i>Level of Service</i>	<i>Program Management</i>	<i>Regulatory Compliance</i>	<i>Operation and Maintenance</i>	<i>Capital Improvement Projects</i>
5	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded
4	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets
3	Priority Planning & Partial CIP Implementation Capabilities	Minimal Permit Compliance	Mixture of Inspection and Responsive Based	Complaint, Inspection-Based / Moderate Budget
2	Reactionary Planning & Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only	Critical Needs Only / Minimum Budget
1	No Planning & No CIP Implementation Capabilities	Non-Compliance	Non-Responsive	No Planning / No Budget

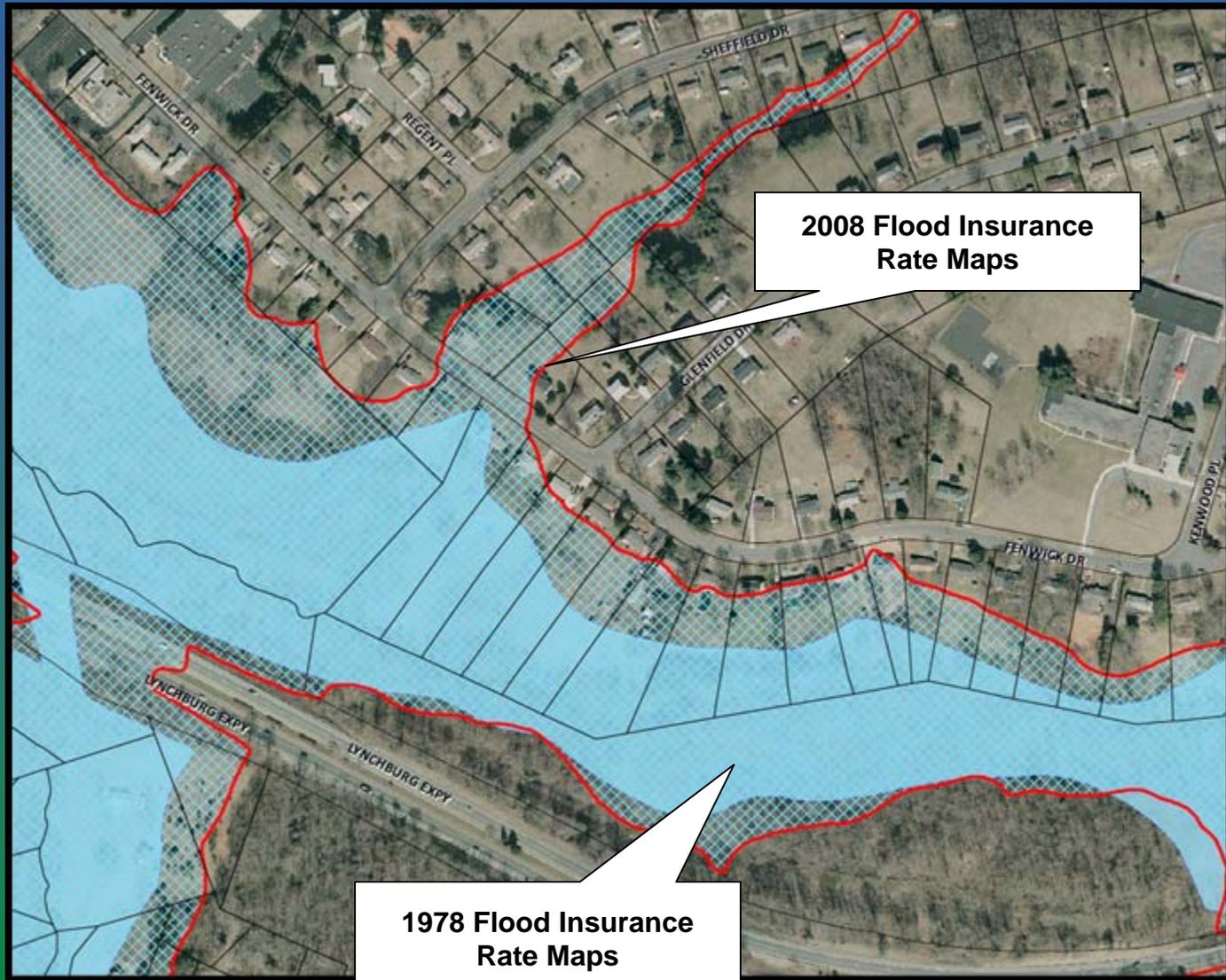
There Are Tools To Predict Capacity Needs for Stormwater



Studies Can Accurately Identify Stormwater Issues



Models Can Be Used to Predict Limit of Floodplains



2008 Flood Insurance Rate Maps

1978 Flood Insurance Rate Maps

General Costs for Master Plan Development



- **Components:**
 - Field data collection
 - Existing and future conditions
 - Hydrologic / Hydraulic modeling
 - Meet Regulatory Mandates (Chesapeake Bay TMDL)
 - Alternatives analysis
 - Recommendations

**Study Costs (Raleigh Historical Data) –
Average Cost = \$20K to \$40K per square mile**

Characteristics/Benefits of Levels of Service for Program Management



Level of Service	Characteristics	Benefits
5	Continuously Updated Planning Documents	Potential Problems are Anticipated and Mitigated
4	Planning Leads to List of Priorities	Most Problems are Anticipated and Eliminated
3	Priorities Set Based on Complaints and “Educated Guesses”	Stormwater Impacts Addressed Reactively
2	Regulatory Planning and Minimal CIP Implementation	Satisfy Current Permit Requirements

Regulatory Compliance LOS Options



<i>Level of Service</i>	<i>Program Management</i>	<i>Regulatory Compliance</i>	<i>Operation and Maintenance</i>	<i>Capital Improvement Projects</i>
5	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded
4	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets
3	Priority Planning & Partial CIP Implementation Capabilities	Minimal Permit Compliance	Mixture of Inspection and Responsive Based	Complaint, Inspection-Based / Moderate Budget
2	Reactionary Planning & Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only	Critical Needs Only / Minimum Budget
1	No Planning & No CIP Implementation Capabilities	Non-Compliance	Non-Responsive	No Planning / No Budget

Compliance Language in City's NPDES Permit



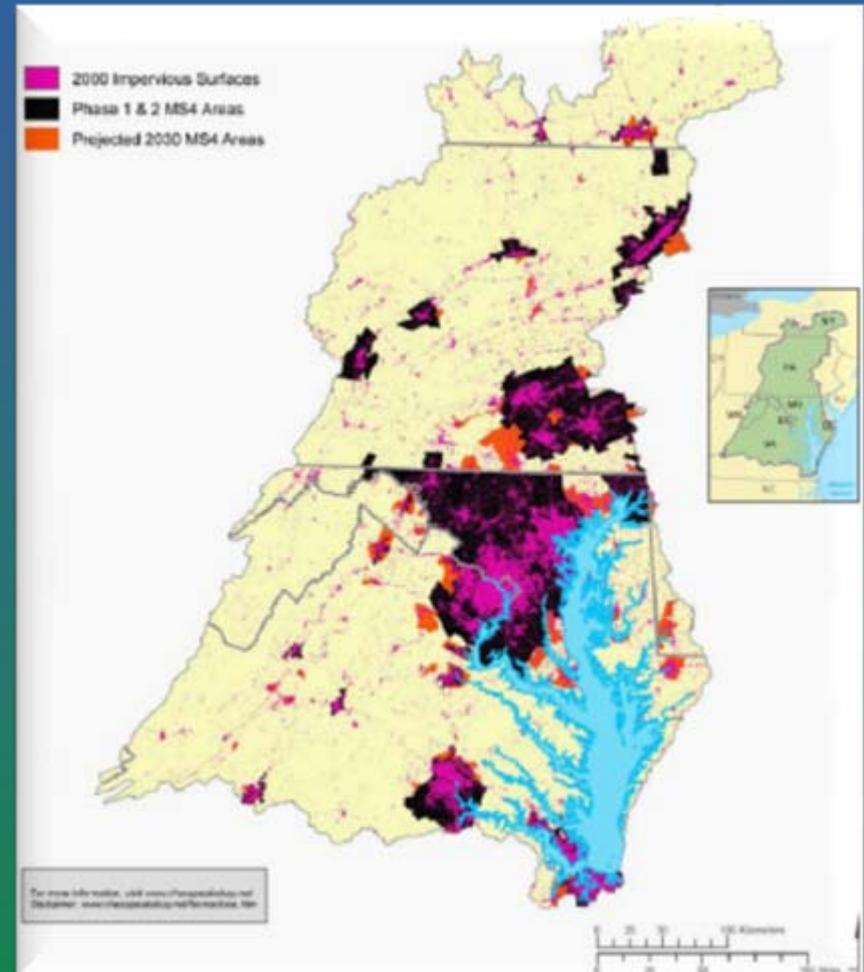
4VAC50-60-1220. of NPDES General Permit

The failure to provide adequate program funding, staffing or equipment maintenance shall not be an acceptable explanation for failure to meet permit conditions.

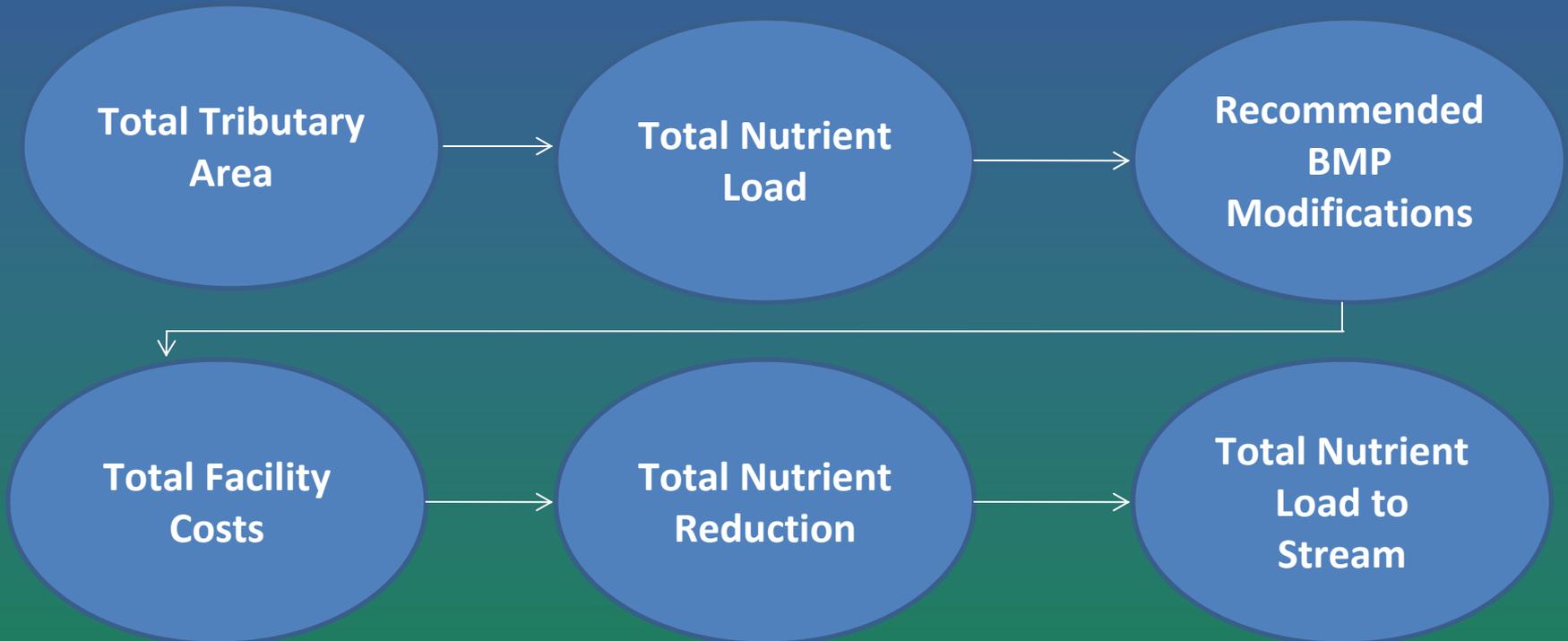
City of Lynchburg Screening Level Estimate of Stormwater Retrofit Cost for Bay TMDL



- Performed literature search to identify potential retrofit costs based on impervious area
- Estimated \$800K to \$1.7M annually for various scenarios
- Annual O&M cost is estimated at 5% of capital costs



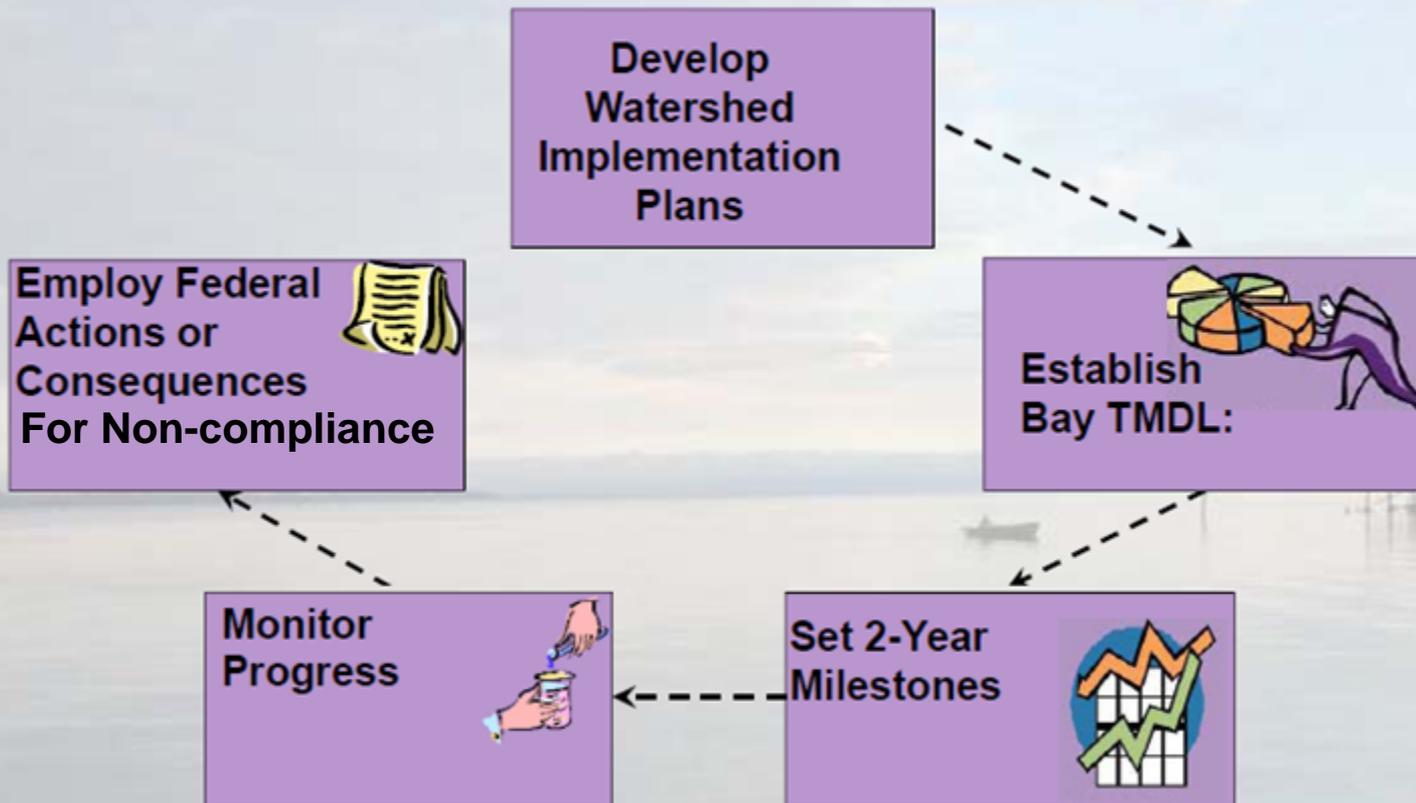
Roadmap: Evaluation Process for Nutrient TMDL Compliance



Pending Chesapeake Bay TMDL



Mandatory Pollution Diet at Work



Pending Other Regulatory Driven Stormwater Activities



- Increased enforcement action related to ensuring BMP maintenance
- Expanded requirements for local implementation program
- Requirements for monitoring and maintenance
- BMP Retro-fits

Operation and Maintenance LOS Options



<i>Level of Service</i>	<i>Program Management</i>	<i>Regulatory Compliance</i>	<i>Operation and Maintenance</i>	<i>Capital Improvement Projects</i>
5	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded
4	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets
3	Priority Planning & Partial CIP Implementation Capabilities	Minimal Permit Compliance	Mixture of Inspection and Responsive Based	Complaint, Inspection-Based / Moderate Budget
2	Reactionary Planning & Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only	Critical Needs Only / Minimum Budget
1	No Planning & No CIP Implementation Capabilities	Non-Compliance	Non-Responsive	No Planning / No Budget

Current Operation & Maintenance Services



Service Area = 50 sq. mi.

900+ lane miles of roadway

30+ miles of storm sewer

4,200+ storm inlets

10+ miles of culverts



Pond Maintenance



Infrastructure
Cleaning & Repair



Ditch Repair

Considerations to Increase the Level of Service for Operations and Maintenance



- **Organize Program to Pro-Actively Maintain the System**
 - Complete the stormwater system inventory
 - Perform a condition assessment survey of system (complete a portion annually)
 - Systematically CCTV chronic problem areas
 - Systematically clean and flush problem areas on a priority basis



Benefits of a Comprehensive Maintenance and Asset Management Program



- Reduction of pollutants entering streams
- Achieve design life of facility (assets)
- Reduced cost of repair and unplanned expenses
- Reduced incidents of erosion, nuisance flooding, etc.
- Improved citizen service



Capital Improvement Projects LOS Options



<i>Level of Service</i>	<i>Program Management</i>	<i>Regulatory Compliance</i>	<i>Operation and Maintenance</i>	<i>Capital Improvement Projects</i>
5	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded
4	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets
3	Priority Planning & Partial CIP Implementation Capabilities	Minimal Permit Compliance	Mixture of Inspection and Responsive Based	Complaint, Inspection-Based / Moderate Budget
2	Reactionary Planning & Minimal CIP Implementation Capabilities	Below Minimum Permit Compliance	Responsive Only	Critical Needs Only / Minimum Budget
1	No Planning & No CIP Implementation Capabilities	Non-Compliance	Non-Responsive	No Planning / No Budget

Capital Project Expenditures



Project Name	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	Avg. Annual Cost
Annual Stormwater Infrastructure Costs						
<i>Storm Drainage System Repairs/Replacement¹</i>	\$ 320,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 224,000
<i>Culvert Replacement Program¹</i>	\$ 550,000	\$ -	\$ 550,000	\$ -	\$ 550,000	\$ 330,000
<i>Annual Subtotal</i>	\$ 870,000	\$ 200,000	\$ 750,000	\$ 200,000	\$ 750,000	\$ 554,000
Transportation and Non-Routine Capital Costs						
<i>Greenview Drive Phase II</i>	\$ 1,000,000	\$ 500,000	\$ -	\$ -	\$ -	\$ 300,000
<i>Dam Safety College Lake²</i>	\$ -	\$ -	\$ 1,050,000	\$ 1,050,000	\$ -	\$ 420,000
<i>Midtown Connector Phase II</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<i>Timberlake Road @ Logan's Lane</i>	\$ -	\$ -	\$ -	\$ 130,000	\$ 294,000	\$ 85,000
<i>Dearington Neighborhood Street Improvements</i>	\$ -	\$ -	\$ 143,000	\$ -	\$ -	\$ 29,000
<i>Kemper St. Bridge & Interchange</i>	\$ 143,000	\$ 588,000	\$ 270,000	\$ -	\$ -	\$ 200,000
<i>Florida Avenue Bridge</i>	\$ 78,000	\$ -	\$ -	\$ -	\$ -	\$ 16,000
<i>Atherholt Road Extension</i>	\$ -	\$ -	\$ 46,000	\$ 466,000	\$ -	\$ 102,000
<i>General Street Improvements</i>	\$ 188,000	\$ 188,000	\$ 188,000	\$ 188,000	\$ 188,000	\$ 188,000
<i>Annual Subtotal</i>	\$ 1,409,000	\$ 1,276,000	\$ 1,697,000	\$ 1,834,000	\$ 482,000	\$ 1,340,000
Totals	\$ 2,279,000	\$ 1,476,000	\$ 2,447,000	\$ 2,034,000	\$ 1,232,000	\$ 1,894,000

Note:

1. Project is considered 100% stormwater
2. Stormwater-related cost provided is 25% of total project cost as determined by City staff estimate of past projects

Capital Improvement Program Options



- Provide adequate funding to implement retrofit projects to meet the 2-yr Chesapeake Bay TMDL milestones
- Augment existing CIP needs with results of master planning and/or condition assessment efforts
- Establish parameters for prioritizing CIP needs
- Optional: Establish a fund/program to share costs with private property owners for stormwater maintenance/improvements

Characteristics/Benefits of Levels of Service for Capital Improvement Program



Level of Service	Characteristics	Benefits
5	Priorities Clear and Funding in Place	Problems are Mitigated Proactively (no backlog)
4	Planned and Prioritized List of CIP Projects	Problems are Mitigated Systematically (by schedule)
3	Regular Budget in Place for Annual Projects	Short-term Project Needs Addressed
2	Critical Needs Only	Reactive Problem Solving

Future Level of Service Cost Summary



Level of Service	Program Management	Regulatory Compliance	Operation and Maintenance	Capital Improvement Projects	Total Program Cost
5	\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$	\$\$\$\$\$
	Comprehensive Planning & Full Implementation Capabilities	Exemplary Permit Compliance	Fully Preventative/ 100% Routine	Prioritized / Fully-Funded	
4	\$\$\$\$	\$\$\$\$	\$\$\$\$	\$\$\$\$	\$\$\$\$
	Pro-Active Planning & Systematic CIP Implementation Capabilities	Pro-Active Permit Compliance	Mixture of Routine and Inspection Based	Phased Implementation / Allocated Budgets	
3	\$\$\$	\$467,000 + \$\$\$	\$959,000	\$\$\$	\$\$\$
	Priority Planning & Partial CIP Implementation Capabilities	Minimum Permit Compliance Resources at Capacity	Limited Routine Activities Lack of Dedicated Resources	Complaint, Inspection-Based / Moderate Budget	
2	\$342,000	N/A	N/A	\$554,000	\$2,322,000
	Well-Trained, In-House Staff Minimal Long Range Planning	---	---	Critical Needs Only / Minimum Budget	

- Existing Level of Service approximately 2.5
- Future Level of Service planned for Next Meeting

Tonight's Agenda:



- Summary of Last Meeting
- Introduction to Level of Service and Program Evaluation
- Alternative Levels of Service and Benefits
- **Discussion Session**

Questions to Consider...



- What are your thoughts on the City's current level of service for stormwater management?
- Does there appear to be a need to consider a higher level of service for customers?
- What programs and activities discussed tonight should be priorities for the City?

Group Discussion on Level of Service



Next Meeting



- **Topics**

- Costs for Alternative Levels of Service & Regulatory Compliance
- Stormwater Program Funding Options

- **Time and Location**

- Thursday, September 16, 2010 (6pm to 8pm)
- Location: James River Conference Center



City of Lynchburg

Stormwater Management

Stormwater Advisory Committee

QUESTIONS?



CDM